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Title: Fission to Fusion: An Island Goes Missing

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**Fission to Fusion: An Island Goes Missing**
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Hollywood actor Reed Hadley walked the decks of the USS Estes with the practiced ease characteristic of his profession. Stopping periodically to relight his pipe, Hadley narrated an AEC film depicting the final hours and minutes leading up to the detonation of Mike, the world's first thermonuclear bomb. Hadley's smooth camera presence contrasted sharply with those of the scientists and technicians he interviewed, particularly Alvin Graves, who came across wooden and condescending.[1] Just after Hadley put on his dark goggles to prevent flash blindness, Mike exploded with a force of 10.4 megatons, completely vaporizing the entire ground zero island of Elugelab.[2] The film made one thing clear – Los Alamos scientists could build a thermonuclear bomb, but they could not act.[3]

Watching a seismograph in the basement of the geology building at the Berkeley campus of the University of California, Edward Teller knew within minutes that Mike had detonated. *"At exactly the scheduled time,"* he said, *"I saw the light point move. The sound waves took twenty minutes to carry the message under the Pacific and arrive at Berkeley."*[4] Gordon Dean, Chairman of the Atomic Energy Commission, waited until evening to tell the President.[5] Constrained by security regulations, Dean told the President *"On the matter which I discussed with you the other evening this is simply to report that the mission was carried out with highly successful results. I'm doing everything possible to keep this info from becoming public until after Tuesday* [election day]." As Dean recorded in his office diary, the President said, *"he appreciated the situation and thanks a lot."*[6]

At a conference held ten years earlier, in the summer of 1942, Teller suggested the possibility of a super, or thermonuclear, bomb. As Robert Serber recalled the scene, "*Everybody turned eagerly to discuss the super forgetting all about the atomic bomb as if that was an accomplished fact already."*[7] That eagerness quickly faded because radiation cooling would

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[1] Alvin Graves came to Los Alamos from the University of Chicago in 1944. He became the Deputy Scientific Director for Operation Sandstone (1948) and Scientific Director for Operation Greenhouse (1951) and continued in that role for Operations Ivy (1952) and Castle (1954). He died in 1965.

[2] DOE/NV-209

[3] Operation Ivy Motion Picture Film.

[4] Edward Teller and Judith Schoolery. Edward Teller: Memoirs – A Twentieth Century Journey in Science and Politics (Cambridge, Massachusetts: Perseus Publishing, 2001), 352; Edward Teller, The Legacy of Hiroshima (Garden City, NY.: Doubleday, 1962), 55; and Richard Rhodes, Dark Sun: The Making of the Hydrogen Bomb (New York: Simon & Schuster, 1995), 511.

[5]Dean delayed informing Truman because the President was campaigning in the Midwest for presidential candidate Adlai Stevenson.

[6] Gordon E. Dean and Roger Anders, Forging the Atomic Shield: Excerpts from the Office Diary of Gordon E. Dean (Chapel Hill: University of North Carolina Press, 1987), 229-230; and Richard Hewlett, Atomic Shield, 592- 593.

[7] Robert Serber, Oral Interview, 1986.

quickly stop a thermonuclear reaction.[8] Nevertheless, work on a super bomb was included as part of the wartime Laboratory's *Hydrodynamics of Implosion and Super Group* and later *The Super and General Theory Group,* both led by Teller.[9] The wartime research provided the basis for a 1946 conference that concluded, *"the super bomb can be constructed and will work."* The conference also recommended that the pursuit of the hydrogen bomb *"be raised to the highest national power."*[10] That would not happen for another three years.[11]

In July 1949, at the instigation of the Joint Chiefs of Staff, President Truman created a three-member special subcommittee of the National Security Council (NSC) *"to assess the rate of progress being made in our atomic program."* The subcommittee's members, David Lilienthal, Chairman of the AEC, along with Secretary of State Dean Acheson and Secretary of Defense Louis Johnson, recommended an acceleration of the nation's atomic program.[12] Not long after, a B-29 snooper aircraft flying over Alaska picked up radioactive debris from a Soviet nuclear detonation. Soon after, contaminated rainwater samples collected on the roof of the National Bureau of Standards building in Washington, D.C., confirmed the B-29 data.[13] The Soviet Union had detonated its first atomic bomb, quickly nicknamed Joe 1, on August 28, 1949.[14] President Truman announced the Soviet detonation on September 23rd, saying, *"I believe the American people, to the fullest extent consistent with national security, are entitled to be informed of all developments in the field of atomic energy. That is my reason for making public the following information. We have evidence that within recent weeks an atomic explosion occurred in the U.S.S.R. Ever since atomic energy was first released by man, the eventual development of this new force by other nations was to be expected."*[15]

Edward Teller said, *"It seems that the Russian rate of progress is at least comparable to, if it does not exceed, the rate of progress in this country."*[16] John Manley, a senior Los Alamos scientist, concluded that given American inability to predict Soviet success, United States policy should seek *"to strengthen our position as rapidly as possible and maintain a rate of progress*

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[8] Ibid.

[9] Carson Mark, LA-5467-MS: A Short Account of the Los Alamos Theoretical Work on Thermonuclear Weapon, LANL Archives, 1971, 3.

[10] LA-575: The History of the Super (Deleted Version).

[11] Sidney Souers Oral History, Truman Library; and N.E. Bradbury to the AEC, 1947.

[12] Harry S. Truman, Years of Trial and Hope, 302; McGeorge Bundy, Danger and Survival, 203.

[13] Charles A. Ziegler and David Jacobson, Spying without Spies: Origins of America's Secret Surveillance System (Westport, Connecticut: Praeger, 1995), 190-193.

[14] Frank Shelton, Reflections of a Nuclear Weaponeer, 4-7.

[15] http://www.atomicarchive.com/Docs/Hydrogen/SovietAB.shtml; Furer, 114.

[16] Edward Teller, To Technical Council Members, October 12, 1949

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*limited only by our resources for a relatively long period of time."*[17] AEC Commissioner Lewis Strauss circulated a memo among his fellow commissioners proposing an expansion of the hydrogen bomb program, saying, *"that the time has now come for a quantum jump in our planning … that is to say, that we should now make an intensive effort to go ahead with the Super."*[18]

Strauss' memo *"sparked a secret debate within the government about whether or not to initiate a crash program to develop the hydrogen bomb."*[19] Senator Brien McMahon, Chairman of the Joint Committee on Atomic Energy, *"believed a crash program to develop the super"* was critically important.[20] Lilienthal and Oppenheimer argued that the nation's nuclear stockpile of fission weapons was sufficient to protect the country.[21] Strauss asked his friend Sidney Souers, the executive director of the National Security Council, if Truman was aware of the Los Alamos work on the hydrogen bomb. Souers did not know and told Strauss he would ask Truman about it the next day. As Souers recalled many years later, *"I asked him [the President] if he had any information on it. He said, 'No, but you tell Strauss to go to it and fast."*[22] The President of the United States finally knew about the possibility of the hydrogen bomb.[23]

Truman was initially content to let science and technology take their course. However, when Colorado Senator Edwin Johnson told a television interviewer that Los Alamos was working on a hydrogen bomb, Truman felt he needed to act. He instructed the NSC special subcommittee to reconvene and discuss *"whether and in what manner the United States should undertake the development and possible production of super atomic weapons … and whether and when any publicity should be given this matter."*[24] At the subcommittee's first meeting, Lilienthal opposed the hydrogen bomb on moral grounds. Such a bomb would kill too many people. Secretary of Defense Louis Johnson, echoing the unanimous view of the Joint Chiefs, supported its quick development.[25] Acheson slightly favored building the hydrogen bomb,

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[17] H. Manley, To Members of the Technical Council, October 13, 1949.

[18] Lewis Strauss, Men and Decisions (Garden City, NY: Doubleday, 1962), 217.

[19] Dean Acheson, Present at the Creation: My Years in the State Department (New York: W.W. Norton, 1969), 344; Gordon Dean, Forging the Atomic Shield, 35; and Herbert York, The Advisors: Oppenheimer, Teller and the Superbomb (Stanford: Stanford University Press, 1976), 45; Lewis Strauss, Men and Decisions, 222.

[20] Dean Acheson, Present at the Creation, 344 – 346; Gordon Dean, Forging the Atomic Shield, 18.

[21] Herbert York, The Advisors, 56.

[22] Sidney Souers Oral Interview, Truman Library.

[23] Richard Hewlett, The New World, 374.

[24] Lewis Strauss, Men and Decisions, 222 and Dean Acheson, Present at the Creation, 346; McGeorge Bundy, Danger and Survival, 212.

[25] Omar N. Bradley, A General's Life: An Autobiography by General of the Army Omar N. Bradley (New York: Simon and Schuster, 1983), 515.

believing Lilienthal's moral argument unpersuasive because the Soviet Union would not delay their development of a super bomb. Equally compelling, said Acheson*, "the American people simply would not tolerate a policy of delaying research in so vital a matter."*[26]

After their meeting, Acheson prepared a set of four recommendations that he hoped both Lilienthal and Johnson would endorse:

- The first recommendation called for the President *to "direct the Atomic Energy Commission to proceed to determine the technical feasibility of a thermonuclear weapon, the scale and rate of effort to be determined jointly by the Atomic Energy Commission and the Department of Defense."*

- The second recommendation gave the President the option of deferring the final development of the hydrogen bomb pending a possible reexamination *"as to whether thermonuclear weapons should be produced beyond the number required for a test of feasibility."*

- The third recommendation directed *"the Secretary of State and the Secretary of Defense to undertake a reexamination of our objectives in peace and war and of the effect of these objectives on our strategic plans, in the light of our probable fission bomb capability and possible thermonuclear bomb capability of the Soviet Union."*

- The fourth and final recommended that *"the president [should] indicate publicly the intention of this Government to continue work to determine the feasibility of a thermonuclear program, and that no further official information will be made public without the approval of the President."*[27]

Acheson presented his recommendations at the subcommittee's second (and last) meeting at 10:15 am on January 31, 1950.[28] Secretary Johnson objected to the wording of Acheson's second recommendation. He did not want any encumbrance placed on the production of weapons. After some debate, both Acheson and Lilienthal agreed to excise the paragraph. Once this was done, all three committee members, including Lilienthal much to Acheson's' surprise, signed the recommendations. Lilienthal decided not to directly oppose Acheson and Johnson, choosing instead to register his personal reservations directly with Truman.[29] Undersecretary of

[26] Dean Acheson, *Present at the Creation*, 349.

[27] Dean Acheson, Present at the Creation, 349; and David E. Lilienthal, The Journals of David E. Lilienthal, Volume II, 624.

[28] Ibid.

[29] Dean Acheson, Present at the Creation, 349

Defense Stephen Early, a former presidential press secretary who attended this meeting, suggested that the President would be best served and the decisions would seem less ominous if his decision were announced in a press release rather than at a press conference. Accordingly, a draft press release was prepared for the President saying that as Commander-in Chief, he had *"directed the Atomic Energy Commission to continue its work on all forms of atomic weapons, including the so-called hydrogen or super-bomb."* It concluded that this work was and would continue to follow American objectives *"until a satisfactory plan for international control of atomic energy is achieved."*[30]

Secretary Johnson, who had a scheduled meeting with the President that day, suggested that the subcommittee use his appointment to report to Truman. *"The heat was on,"* said Johnson, *"and every hour counted in getting this matter disposed of."* At 12:35 pm, Acheson handed the President the subcommittee's report, which Truman started to read. Acheson also told Truman that Lilienthal wished to make a statement. Shortly after Lilienthal began expressing his misgivings, Truman cut him off, approved the recommendations, and said that further discussions were impossible since Senator Johnson had made the issue public. *"Further delay,"* said Truman, *"would be unwise."* Seven minutes after entering the Oval Office, the committee left. Later that day, Truman issued the prepared press release.[31]

Truman spoke little of the hydrogen bomb after his January 31st press release.[32] In a news conference held on February 2nd, he effectively shut down all inquiries about his decision. However, the President did allow Acheson to make a quasi-public speech in February that reflected the administration's thinking. Noting that many people were *"rightly troubled"* by developing this *"new and very terrible weapon,"* Acheson argued that it meant only *"that we must be even more calm and even more steady than we have been in the past, because the responsibilities and the consequences of not being calm and not being steady are more terrible than they were before."*[33]

The quest for the hydrogen bomb is notable primarily for the political angst generated and sustained by early Cold War paranoia. One of the outcomes of this paranoia was the pillorying of America's most famous scientist, J. Robert Oppenheimer, whose career was tarnished. Although the development of the hydrogen bomb was a politically charged issue, reality was quite different. As Truman's Assistant Press Secretary, Eben Ayers, recorded in his diary on February 3, 1950, *"The President said there actually was no decision to be made on the H-Bomb, we have got to have it if only for bargaining purposes with the Russians."* [34]

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[30] David Lilienthal, The Journals of David E. Lilienthal, Vol. 2, 626-633; Dean Acheson, Present at the Creation, 348-349; and Harry S. Truman, Public Papers 1950, #26; and Harry S. Truman, Years of Trial and Hope, 309.

[31] Ibid; In his memoirs, Truman does not mention Lilienthal's attempt to qualify his support, saying only that the recommendations were "unanimously signed".

[32] Harry S. Truman, Public Papers, 1950, #29.

[33] Dean Acheson, State Department Bulletin, Vol. 21, 274.

[34] See Richard Rhodes, Dark Sun; David Holloway, Stalin and the Bomb: Making the Russian Bomb; Harold Agnew Oral Interview, LANL Archives; and Frank Shelton, Reflections of a Nuclear Weaponeer, 1-10; Eben Ayers with Robert H. Ferrell, Truman in the White House: The Diary of Eben A. Ayers.

According to General of the Army Omar Bradley, Truman had already made up his mind before the NSC special subcommittee presented its report to the President. Bradley, who met privately with the President on three occasions in January to discuss the hydrogen bomb, recalled in his memoirs: *"Truman was deeply troubled because AEC Chairman David Lilienthal was a humanitarian whom Truman greatly respected. But Truman had a way of seeing things clearly and going to the heart of the matter. If the Russians proceeded with the H-Bomb and we did not, and it worked, we would find ourselves in an intolerably inferior military posture. To Truman, it was as simple as that."*[35] As subsequent events revealed, the Soviet Union was indeed developing the hydrogen bomb and, in fact, designed, built, and tested such a weapon before the United States.

[35] Omar Bradley with Clay Blair, A Generals' Life: An Autobiography by General of the Army Omar N. Bradley. New York: Simon and Schuster, 1983.